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SUSTAINABLE SUGARCANE INITIATIVE (SSI) BUSINESS MODEL & BANK PROPOSAL



BIHAR

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Registered offices:

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Umbrella Programme for Natural Resource Management

A2/18, Safdarjung Enclave

New Delhi 110 029 India

T: +91 11 4949 5353

F : + 91 11 4949 5391

E: info@giz.de

I: www.giz.de

Responsible

Mohamed El-Khawad

Program Director and Cluster Coordinator

Environment, Climate Change and Biodiversity

Email: mohamed.el-khawad@giz.de

Rajeev Ahal

Director, Natural Resource Management

Email: rajeev.ahal@giz.de

Technical Partner

Access Development Services

Content Review

Vikash Sinha, Technical Expert, GIZ

Editor

Raj Pratim Das

Design and Layout

Rouge Communications

rougecommunications@gmail.com

Photo credits/GIZ

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SUSTAINABLE SUGARCANE INITIATIVE (SSI)

BUSINESS MODEL & BANK PROPOSAL

BIHAR

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INTRODUCTION

Sugarcane is a widely grown crop in India and occupies a very prominent position in the agriculture sector of India. It is mainly cultivated in Uttar Pradesh, Maharashtra, Karnataka and Tamil Nadu. In a global perspective, India is the 2nd largest Sugarcane producer after Brazil. However, India is inching towards the world leader in sugarcane production as recent forecast suggests Brazil's production is expected to be 34.2 million tons and India's production will be 33.83 million tons for 2018-19¹². Sugarcane production has significantly benefited farmers in improving the standard of living and better profit realisation. However, its cultivation is not sustainable at this level as it required a large amount of water and current cultivation practice.

There is tremendous scope of improving productivity and sustainable cultivation practice while identifying new potential areas where sugarcane cultivation could be promoted. There are 35 million farmers growing sugarcane and another 50 million depend on employment generated by the 571 sugar factories and other related industries using sugar³. This scale of engagement and employment generation could be jeopardised if sustainable way of cultivation is not promoted in longer run.

¹*Sweet Spike: India set to replace Brazil as biggest producer of sugar, Business Standard 3rd Sep 2018*

²*Sugar: World Market and Trade, USDA, May 2018*

³*Training Manual on Sustainable Sugarcane Initiative: Improving Sugarcane Cultivation in India, an Initiative of ICRISAT-WWF Project, ICRISAT*

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CURRENT SCENARIO IN SUGARCANE FARMING IN INDIA

India's domestic sugar market is in peculiar condition as international sugar price continuously falling while the cost of sugar production and market price is higher in India, which makes it difficult for India to sell in the international market. While India's sugar production is continuously growing and predicted to hit all time high at 34.2 million tons production. The major challenges are:

- » Higher cost of production and water use
- » Unsustain growth of sugar production
- » Higher cane price versus lower sugar price in market
- » Pilling-up dues to farmers and government need to announce subsidy
- » Significantly higher production as compare to domestic demand

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SUSTAINABLE SUGARCANE CULTIVATION

Sustainable Sugarcane Initiative (SSI) is a much-needed in present condition given the fact that ground water and rainfall level are deteriorating continuously and sugarcane production need much higher rate of irrigation. As Maharashtra and Western Uttar Pradesh produce a higher amount of cane, availability of water has significantly reduced over the years in these regions.

SSI cultivation could be game-changer if it is adopted in a scientific way, which will reduce the natural resources use, fertiliser application and a significant increase in production

3.1 Brief overview of SSI

SSI is a method of sugarcane production, which involves using less seeds, less water and optimum utilisation of fertilisers and land to achieve more yields. Driven by farmers, SSI is an alternative to conventional seed, water and space intensive Sugarcane cultivation.

The major principles that govern SSI are:

- Raising nursery using single budded chips.
- Transplanting young seedlings (25-35 days old).
- Maintaining wide spacing (5X2 feet) in the main field.
- Providing sufficient moisture and avoiding inundation of water.
- Encouraging organic method of nutrient and plant protection measures.
- Practicing intercropping for effective utilisation of land.

² Power in global value chains: Implications for employment and livelihoods in the cashew nut industry in India, March 2006

Comparison between conventional farming and SSI

Aspect	Conventional	SSI
Seeds/Setts	48,000 buds (16,000 three budded setts/acre)	5,000 buds (5,000 single budded chips/acre)
Nursery preparation	No	Yes
Measures to maintain uniformity among Plants	No Grading	Grading is done during nursery
Planting	Direct planting of setts in the main Field	Transplanting of 25-35 days old young seedlings raised in a nursery
Spacing	1.5 - 2.5 ft between rows	5 ft between rows
Water requirement	More (flooding of field)	Less (maintenance of moisture in the furrows)
Mortality rate among plants	High	Low
No. of tillers per plant	Less (10-15)	More (20-25)
No. of millable canes achieved per clump	4-5	9-10
Accessibility to air and sunlight	Low	High
Scope for intercrop	Less	More

SSI follows improved cultivation practices. Instead of planting large number of seeds/setts directly on fields, SSI^[1] recommends to grow buds in a nursery and thereafter, transplant plant young seedlings (25-35 days old) on the field. Due to this practice, the better growth of plants is ensured. Increased spacing (5 ft between rows) enhances scope of intercropping and also plant obtains abundant sunlight, moisture and nutrients. It results into a large number of tillers, almost two times than the conventional method. Selection of healthy seedling, nurturing them in nursery and availability of sufficient nutrients and water in SSI makes plant healthy and reduces mortality of plants across various stages from transplantation to full grown plant. The differences in cultivation practices between conventional farming and SSI is illustrated in the below table.

Note: SSI is a package of practices (PoPs) as defined in the [ICRISAT-WWF](#) Project, However, promoting SSI required customise modification and changes as per the need of local geography. It should be promoted as a Climate Smart Sugarcane Initiative with developing special PoPs based on local geographic needs.

Source: Training Manual on Sustainable Sugarcane Initiative: Improving Sugarcane Cultivation in India, an Initiative of ICRISAT-WWF Project, ICRISAT.

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SSI & UMBRELLA PROGRAMME FOR NATURAL RESOURCE MANAGEMENT (UPNRM)

The National Bank for Agriculture and Rural Development (NABARD) in collaboration with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and German Development Bank (KfW⁴) is implementing the Umbrella Programme on Natural Resource Management (UPNRM) for funding community managed natural resource management (NRM) based rural livelihood/ development projects. Under this programme, GIZ is supporting NABARD in developing innovative and pro-poor financing mechanisms with a view to augment private financial resource flows in the natural resource management and agriculture sectors as well as to improve the efficiency of implementation.

UPNRM comprises two closely linked components. The first supports the development and marketing of new financial products that are primarily credit-based. The second component supports forging systematic public private partnerships between rural producer organisations, the private sector, NGOs and NABARD in selected regions. The program envisages a gradual shift from grant based to loan based NRM projects and funding through a corpus comprising financial cooperation from KfW as well as fund mobilised by NABARD from various sources.

Till March 2017, NABARD has sanctioned around 325 project proposals submitted by various implementing agencies, which in the context of UPNRM are called Channel Partners (CP). Currently, CPs that are implementing UPNRM supported projects which include NGOs, cooperatives/producer companies, Micro Finance Institutions (MFIs), corporates and one state owned enterprises. These different types of organisations, however, bring various levels of staff competencies, a range of organisational structures as well as differing financial and management procedures.

Under UPNRM, SSI in Maharashtra and Bihar is undertaken with primary support to sugar cooperative in Maharashtra and non-profit channel partner in Bihar. The primary purpose under SSI is to use drip irrigation and POP to promote sustainable sugarcane cultivation. The entire project is promoting sustainable sugar farming with a marketable financial model for a small and marginal farmer to migrate from water reach practice to less natural resource-driven farming. Under UPNRM, NABARD has sanctioned INR 17 cr as assistance covering 1800 ha of sugarcane farming to six good sugarcane cooperatives and one project in Bihar involving 200 farmers and 200 acres which later scaled to 1000 farmers after initial success.

⁴ Kreditanstalt für Wiederaufbau (Reconstruction Credit Institute)- German government-owned development bank

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METHODOLOGY ADOPTED

Based on RFP and existing documents on SSI promotion under UPNRM project, ACCESS team has carried out a thorough desk review. The survey instrument was developed for collecting cost economy data related to SSI farmers. Data collection instrument was finalised after getting feedback from expert and GIZ team.

The data collection was done in consultation with Indian Rural Association (IRA) - channel partner for the Bihar under UPNRM. A convenient sampling from total 200 intervention farmer and direct one to one data collection from 15 farmers conducted. A Focus Group Discussion (FGD) was held with IRA & Sugar Factory Management.

Based on data collection and technical expert's observation, final costing was derived. The detail costing table has been incorporated in the report and the survey instrument attached in Annexure 1.



CLIMATE ADAPTATION AND RISK MANAGEMENT ASPECT

India is the world's largest consumer of sugar and the second largest producer after Brazil. However, sugarcane is highly water intensive and recent years have witnessed significant droughts.

Groundwater levels are plummeting and there is immense pressure on available water resources. Water scarcity has led to reduced sugarcane yields.

Climate Smart Agriculture practice has a package of agronomic practices which emphasises water efficiency, improved productivity and reduced production costs. These include methods such as trash mulching, composting, wide planting, intercropping, bio fertiliser application, and nutrient and pest management. Surface and subsurface drip irrigation is an important element of the intervention.

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UPNRM SSI BIHAR INTERVENTION: INDIAN RURAL ASSOCIATION (IRA)

IRA, the channel partner has been provided with a loan and grant support for promoting SSI under UPNRM. The entire intervention has a positive impact on productivity and sugar recovery. The uptake of drip irrigation was not seen much at this stage as a general perception about abundant availability of water in the region. Also, there is ample scope for awareness about water conservation and adoption of drip irrigation methods. The major intervention during the project period was:

- Bud-chip method and nursery preparation for seedling
- Improved varieties of sugarcane
- Use of bio-fertilisers
- Wide Row-Spacing and Intercropping

Project Overview	
Project location	Hasanpur, Samastipur District, Bihar
UPNRM support	Loan: INR 1.14 Crore Grant: INR 0.15 Crore
Duration	3 years
Number of participants	200

7.1 Impact:

IRA has covered 200 farmers under the first phase and given the benefit of the project, it has cascaded to 1,000 farmers. The local Sugar factory in Hasanpur has widely acknowledged productivity enhancement and improved sugar recovery due to SSI intervention.

7.2 Financial comparison on cost associated with SSI Bihar

Bihar only represents 5% of land area covered for sugarcane cultivation in India but given the water and climate suitability, there is multiple possibilities of promoting sugarcane through SSI^[1]. In Bihar, there are 11 private sugar factories with a limited catchment of sugarcane production.

^[1]Sources: Agriculture Statistics at Glance 2016, Directorate of Economics and Statistics, Govt. of India

Under the UPNRM, IRA has promoted some aspect of SSI cultivation with the main focus on the bud chip method for nursery raising and a better variety of cane. The intervention has led to a reduction in chemical fertilisers, relatively less water use and use of bio-fertilisers. The main benefit was in significant improvement in productivity. The farmers have realized 25% to 40% improvement in productivity through the intervention.

Some major benefit to farmers

- » Higher germination percentage
- » High number of millable canes
- » Increased water use efficiency
- » More accessibility to air and sunlight
- » Reduction in cost of cultivation
- » Extra income from intercroops

^[1]Sources: *Agriculture Statistics at Glance 2016, Directorate of Economics and Statistics, Govt. of India*

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SUGARCANE CULTIVATION IN BIHAR – DETAIL COSTING

COST OF SUGARCANE PRODUCTION - Bihar														
PER ACRE CALCULATION			PLANT CROP						RATOON CROP					
			Climate Smart Agri (CSA)			Conventional			CSA			Conventional		
Sr. No.	Particulars of Operation	Unit	Qty	Unit Cost	Total	Qty	Unit per cost	Total	Qty	Unit Cost	Total	Qty	Unit per cost	Total
A - 1	Preparation of Land	Nos		720	720									
	a) MB Ploughing :- Deep	Nos		1000	1000	1	2500	2500						
	b) Cultivator :-					2	1800	3600						
	c) Rotavator	Nos		960	960	1	1750	1750						
	Planking			240	240	1	600	600						
	e) Formation of Trench/ Furrow	Nos				1	1500	1500						
	d) Preparation of Field & Field Channel for trans/Planting	Labour												
					2920			9950						
2	Cost of Seed/Seedling													
	a) seed Material	Qtl	5000	2.25	11250	32	315	10080						
	b) Transport Charges	Trip	3	500	1500	2	500	1000						
					12750			11080						
3	Planting of Sugarcane													
	a) Cleaning, Spreading & Planting	Labour	1	2000	2000	6	200	1200						

	b) Seed Treatment: (100gm Bavistin + 250ml Insecticide)		500 gm	500	500	250 gms	250	250						
					2500			1450						
4	Ratoon management													
	Trash Mulching / Shredding								1	1000	1000			
	Decomposer / Urea								30 Kg	5.32	160			
	Cost of Application								1	200	200			
	Gap Filling/ interculture								1 gap filling		1000	1	Intercultur	3000 3000
											2360			3000
5	Manure Cost													
	a) FYM Mannure/ Press mud - dry wt/Green Manure (Acre)	Ton	10 Ton	150	2250				5PMC	150	750			
	b) Transport of FYM to Field	Trip	1	500	500									
	b) Spreading of Manure in Field	Labour	2	250	500				1	200	200			
	Biofertilizers (Acre)		4	80	320				10	80	800			
					3570						1750			
6	Fertilizer Cost													
	a) Urea	50 kg Bag	100 Kg	5.32	532	196	5.32	1043	200 Kg	5.32	1064	200 Kg	5.32	1064
	b) SSP	50 kg Bag	15 Kg	23	345	55	23	1265	50 Kg	22.5	1125	50 Kg	22.5	1125
	c) MOP	50 kg Bag	10 Kg	11	110	55	11	605	30 Kg	11	330	30 Kg	11	330
	d) Micronutrients	10 kg	10 Kg	30	300	25	30	750	30 Kg	20	600	30 Kg	20	600
	e) Foliar Spray including material		1	1000	1000	1	1500	1500			1000			1000
	f) Applying Fertilizer @ 4 times Labour	Labour	2	200	400	2	200	400	2	200	400	2	200	400
					2687			5563			4519			4519
7	Weed Management :-													
	Mechanised weeding	Nos	1	1000	1000				2	1000	2000	1	3000	3,000
	C) Hand weeding cost					1	3000	3,000				1	2000	2,000
					1000			3000			2000			5000
8	Water Management													

	a) Irrigation - furrow	Hrs												
	b) Irrigation - Flood					150 hours	85	12750				150 hrs (6)	80	12000
	c) Drip-Irrigation			75 Hrs	85	6375				75 Hrs	85	6375		
					6375			12750			6375			12000
9	Pest & Disease control - Soil treatment, Top borer				0	2	550	1100	2	550	1100			4000
	Neemcake, Meta & Beveria, tricocard, pheromone				2000						2000			
					2000			1100			3100			4000
10	Earthing Up/ off barring :- Mechanised	Hrs	2	400	800									
	Earthing up - Labour					15	200	3000				20	200	4000
					800			3000						4000
11	Propping													
	Labour	Labour							6	200	1200	8	200	1600
12	Intercropping	Inclusive			16000									
	Total Cost A 1 -11				50602			47893			21304			34119
	Benefit (Plant+2Ratoon Crop)										22922			
B	Intrest on working capital @10%	%			5060			4789			2130			3412
C	Transport @ Rs.300/-	MT	35	300	10368	25	300	7563	25	300	7500	30	300	9000
	Total A+ B+ C				66030			60245			30934			46531
D	Lease value of Land				10000			10000			10000			10000
					76030			70245			40934			56531



IMPACT OF SSI INTERVENTION

Social:

The project introduced a new scientific technology for cultivation of sugarcane and acceptance among farmers on the adoption of new technology has improved.

- » Adoption of new sugarcane cultivation practice and wider dissemination
- » Due to wider spacing, intercultural operation becomes easy, thus reducing the drudgery among women laborers.
- » Adoption of farm mechanisation techniques
- » New livelihood opportunities/entrepreneurship for seedling preparation

Climate:

- » Soil and water conservation due to wide spacing and nursery-based seedling
- » Reduced electricity and diesel pump usage (due to reduction in irrigation water demand as Drip irrigation and Furrow Irrigation practices)
- » Reduced stubble burning due to mulching – Lower Green House Gas emission

Financial:

- » Higher productivity and profit realisation to farmers
- » Small land holder doing diversified agronomic activity with intercropping
- » Sugar mills realising higher recovery on SSI led intervention

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SCALE-UP AND FINANCE POTENTIAL:

State	Area in Lakh Ha	Total Finance Potential in Cr	Productivity (Tonnes/Ha)
Bihar	2.43	2430	67.9
Maharashtra	9.02	9020	80.5
Karnataka	3.07	3070	80.8
Tamilnadu	1.83	1830	90.1
Uttar Pradesh	22.34	22340	72.7
All-India	47.74	47740	74.4

Source: Director of Sugarcane Development, Govt of India

In India, more than 80 million people is associated with sugarcane directly or indirectly making it one of the major agriculture economy. In recent times, due to deteriorating natural resources, it has become increasingly necessary to promote climate resilient way of cultivation.

Bihar has 2.43 Lakh Ha area under sugarcane cultivation. For promoting drip led irrigation practice at an average per hectare cost of INR 1,00,000/-, Bihar having finance potential in tune of INR 2,430/- Cr.

For promoting Seedling entrepreneur, there is potential to have more than 6000 entrepreneurs and financial potential of more than INR 1200 Cr.



FINANCE FOR PROMOTING SSI

SSI has a significant positive impact on the environment, productivity improvement and higher recovery for the sugar mills. It's high time that SSI should be promoted on a larger scale and present gap funding need to provide for SSI farmer. The following are the potential way of finance and the possible role of different agencies.

11.1 Bank/Financial Institution

SSI cultivation has significant commercial viability and profitability. A special finance scheme needs to be developed in partnership with banks, sugar mills and SSI farmers. An SSI loan requirement is higher than KCC (Kisan Credit Card) limit for sugarcane cultivation and it needs to be considered during the discussion with banks^[1]. Bank may come-up with SSI finance model at market rate with the partnership of Sugar Mill and other direct security by the farmer.

11.2 Government

The government could play a catalytic role in promoting SSI through direct subsidy on drip-irrigation, seedling or credit guarantee for SSI finance. The various state government is providing drip-irrigation / seedling subsidy on different scale which can be recalibrated for promoting SSI as a holistic model.

11.3 Sugar Mills/Cooperatives

Sugar mills are the key stakeholders in the entire value chain. The SSI promotion leads to better millable cane and higher recovery which makes excellent business case for sugar mills. Sugar Mills could provide incentive for adoption of SSI practice and higher cane price as compared to conventional practices.

- Subsidy/Incentive to farmers for adopting drip-irrigation
- Providing high quality Seedling at subsidies rate
- Partnering with Banks/Financial Institution for providing loan to farmer and acting as a guarantor

11.4 NABARD/Development Institutions

NABARD, GIZ, WWF, IFC and ICRISAT have promoted SSI on a different scale and provided critical technical support. In states like Bihar where Sugarcane cultivation is limited but a favorable condition for growth need to be explored and more SSI led bigger pilot with multiple stakeholders needs to be carried out.

- Promoting a bigger scale project on SSI
- Partnering with government/sugar mills for SSI promotion
- Bringing ecosystem partner like finance institution/private mills for collaborative efforts

IFC and Solidaridad Network are doing significant work on promoting Climate Smart Sugarcane Cultivation. The approach of intervention in market led with directly working with private sugar mills and addressing their business challenges with integrating Climate Smart Sugarcane aspect.

IFC and Solidaridad are in partnership with private sugar mills like DSCL Sugar, Coca Cola India, Olam etc. working closely on developing training manual, developing custom PoPs, Capacity Building, Farmer Training and Scale-up with focus on enhancing productivity and reduction in the use of water usage.

The intervention is projected to impact 2 lakh farmers. The private sugar mills, IFC advisory funds and some international donors fund the project.

Source: IFC and Solidaridad Annual report and interaction with Dr R P Singh, Advisor Sugarcane, IFC

11.5 Potential Banks/Financial Institution for promoting SSI

PSBs	Private Banks	RRBs	SFBs
State Bank of India	ICICI BANK	MADHYA BIHAR GRAMIN BANK	UTKARSH
Bank of Baroda	FEDERAL BANK	BIHAR GRAMIN BANK	UJJIVAN
Central Bank of India	AXIS BANK	UTTAR BIHAR GRAMIN BANK	
Punjab National Bank	HDFC BANK		
Canara Bank	INDUSIND BANK		
UCO Bank	KOTAK MAHINDRA		
Union Bank of India	YES BANK		

12

SSI WITH DRIP FARMERS LOAN BIHAR

12.1 SSI with Drip Farmers Loan Fact Sheet

Name of Project	Loan to SSI Farmer
Business	SSI Cultivation with Drip Irrigation
Project Location	Across India where SSI farming promoted
Loan Amount	INR 1,00,000/-
Type of Facility	Cash Credit/Working Capital Loan
Repayment Period	3 years
Repayment Schedule	Bullet/Annually Repayment

Project Cost:

S No	Project Cost	
1	Land, Labour	Own
2	Composite Capital Requirement	1,26,030

12.2 Financial Calculation for Project viability of Drip led SSI cultivation

1. SSI Method with Drip

S No	Project Cost				
Year	1	2	3	4	5
Capital Cost	50,000				
Cost of Cultivation	76,030	40,934	40,934	76,030	40,934
Income from Intercropping	36,000			36,000	
Yield per acre	42	42	42	42	42
Price per MT	3,100	3,100	3,100	3,100	3,100
Income from Cane	130,200	130,200	130,200	130,200	130,200
Total Income	66,200	130,200	130,200	166,200	130,200
Net Income	40,170	89,266	89,266	90,170	89,266

S NoProject Cost					
Year	1	2	3	4	5
Cost of Cultivation	70,245	56,531	56,531	70,245	56,531
Yield per acre	28	28	28	28	28
Price per MT	3,100	310	310	310	310
Income from Cane	86,800	86,800	86,800	86,800	86,800
Net Income	16,555	30,269	30,269	16,555	30,269
Incremental Benefit	23,615	58,997	58,997	73,615	58,997

2. Financial Analysis for Drip-irrigation led SSI method of Sugarcane cultivation

Financial Analysis of With Drip Irrigation Unit					
Particulars	I Year	II Year	III Year	IV Year	V Year
Capital Cost	50,000	-	-	-	-
Recurring Cost	76,030	40,934	40,934	76,030	40,934
Total Cost	126,030	40,934	40,934	76,030	40,934
Total Benefits	166,200	130,200	130,200	166,200	130,200
Net benefits	40,170	89,266	89,266	90,170	89,266
Incremental Benefits	23,615	58,997	58,997	73,615	58,997
Discounting factor@15%	0.87	0.76	0.66	0.57	0.50
NPV of incremental benefits	20,535	44,610	38,791	42,090	29,332
Discounting Factor	0.15				
NPV of costs	231,280				
NPV of benefits	488,338				
BCR	2.11				

12.3. Financial Indicators

Internal Rate of Return (IRR):

The project internal rate of return should be more than 15% as per the current financial scenario of the country. The project IRR is 48.5% therefore it is clearly indicating that the project is feasible for investment.

Payback Period:

The Payback period for the project is 1 year and 11 months. It should be less than 4 to 5 years therefore the project payback periods are within the limit.

Net Present Value:

With a discount rate of 10% and a span of 5 years, the projected cash inflows are worth .INR 4,88,338. Today, this is greater than the initial cash outflow of INR 2,31,280. This results positive NPV of the above project is Rs. 2,57,058 which indicates that pursuing the above project may be optimal with BCR of 2.11.

13

SSI WITHOUT DRIP FARMERS LOAN BIHAR

13.1 SSI with Drip Farmers Loan Fact Sheet

Name of Project	Loan to SSI Farmer
Business	SSI Cultivation without Drip Irrigation
Project Location	Across India where SSI farming promoted
Loan Amount	INR 50,000/-
Type of Facility	Cash Credit/Working Capital Loan
Repayment Period	3 years
Repayment Schedule	Bullet/Annually Repayment

Project Cost:

S No	Project Cost	
1	Land, Labour	Own
2	Composite Capital Requirement	76,030

Means of Finance:

S No	Project Finance	Fund
1	Own Contribution	26,030
2	Bank Finance	50,000

13.2 Financial Calculation for Project viability of without Drip led SSI cultivation

1. SSI Method with Drip

Conventional Method					
Year	1	2	3	4	5
Cost of Cultivation	70,245	56,531	56,531	70,245	56,531
Yield per acre	28	28	28	28	28
Price per MT	3,100	310	310	310	310
Income from Cane	86,800	86,800	86,800	86,800	86,800
Net Income	16,555	30,269	30,269	16,555	30,269
Incremental Benefit	55,015	40,397	40,397	55,015	40,397

2. Financial Analysis for Drip-irrigation led SSI method of Sugarcane cultivation

Financial Analysis of Without Drip Irrigation Unit						
Sr.No.	Particulars	I Year	II Year	III Year	IV Year	V Year
1	Capital Cost		-	-	-	-
2	Recurring Cost	76,030	40,934	40,934	76,030	40,934
3	Total Cost	76,030	40,934	40,934	76,030	40,934
4	Total Benefits	147,600	111,600	111,600	147,600	111,600
5	Net benefits	71,570	70,666	70,666	71,570	70,666
6	Incremental Benefits	55,015	40,397	40,397	55,015	40,397
7	Discounting factor@15%	0.87	0.76	0.66	0.57	0.50
8	NPV of incremental benefits	47,839	30,546	26,562	31,455	20,084
9	Discounting Factor	0.15				
10	NPV of costs	187,802				
11	NPV of benefits	425,988				
12	BCR	2.27				

13.3. Financial Indicators

Internal Rate of Return (IRR):

The project internal rate of return should be more than 15% as per the current financial scenario of the country. The project IRR is 89.5% therefore it is clearly indicating that the project is feasible for investment.

Payback Period:

The Payback period for the project is 1 year and 1 month. It should be less than 4 to 5 years therefore the project payback periods are within the limit.

Net Present Value:

With a discount rate of 15% and a span of 5 years, the projected cash inflows are worth Rs.4,25,988. Today, this is greater than the initial cash outflow of Rs. 1,87,802. The resulting positive NPV of the above project is Rs. 2,38,186 which indicates that pursuing the above project may be positive optimal.

14

SEEDLING ENTREPRENEUR BUSINESS LOAN

SSI promotion involves multiple levels of intervention and for scaling up its adoption, preparation of high quality single bud seedling method is an essential component. The preparation of seedling and selling into the market itself becomes an independent business activity. The entire activities provides multiple employment opportunities in surrounding and required substantial capital. Providing affordable finance becomes an important aspect of promoting SSI and subsequently scaling it up. Here we proposed detail Seedling entrepreneur promoting, the cost associated with it and different financial matrix for business viability.

14.1 Seedling Entrepreneur Loan Fact Sheet

Name of Project	Loan to Seedling Entrepreneur
Business	Preparation and selling of Sugarcane Seedling
Project Location	Across India where SSI farming promoted
Loan Amount	INR 2,00,000
Type of Facility	Term Loan
Repayment Period	3 to 5 years
Repayment Schedule	Quarterly, bi-annual or annual

Project Cost:

S No	Project Cost	
1	One eye bud sett, land and labour	Own
2	Working Capital	240,000

Means of Finance:

S No	Project Cost	
1	Own Contribution	40,000
2	Bank Finance	200,000

14.2 Financial Calculation for Project viability of Seedling Entrepreneur Business

A. Costing of seedling Business

				I Year	II Year	III Year	IV Year	V Year
Sr No	Particulars	Type of Cost	Rs Per Seedling or Cone INR	For 2 Lakh Seedling	For 3 Lakh Seedling	For 5 Lakh Seedling	For 5 Lakh Seedling	For 5 Lakh Seedling
1	Seed / One eye bud sett	Indirect	0.4	80,000	120,000	200,000	200,000	200,000
2	Coco pit	Direct	0.45	90,000	135,000	225,000	225,000	225,000
3	Plastic tray	Direct	0.4	80,000	120,000	200,000	200,000	200,000
4	Labour	Indirect	0.4	80,000	120,000	200,000	200,000	200,000
5	Maintenance	Direct	0.3	60,000	90,000	150,000	150,000	150,000
6	Losses	Direct	0.05	10,000	15,000	25,000	25,000	25,000
	Total		2	400,000	600,000	1,000,000	1,000,000	1,000,000

B. Direct & Indirect Costing

Sr No	Cost/Revenue	I Year	II Year	III Year	IV Year	V Year
1	Cost	400,000	600,000	1,000,000	1,000,000	1,000,000
2	Revenue	500,000	750,000	1,250,000	1,250,000	1,250,000
3	Net Profit	100,000	150,000	250,000	250,000	250,000

C. Cost/Revenue for five years

Sr No	Cost/Revenue	I Year	II Year	III Year	IV Year	V Year
1	Cost	400,000	600,000	1,000,000	1,000,000	1,000,000
2	Revenue	500,000	750,000	1,250,000	1,250,000	1,250,000
3	Net Profit	100,000	150,000	250,000	250,000	250,000

D. Financial Indicator Calculation

Sr.No.	Particulars	I Year	II Year	III Year	IV Year	V Year
1	Capital Cost	200,000	-	-	-	-
2	Recurring Cost	200,000	600,000	1,000,000	1,000,000	1,000,000
3	Total Cost	400,000	600,000	1,000,000	1,000,000	1,000,000
4	Total Revenue	500,000	750,000	1,250,000	1,250,000	1,250,000
5	Net benefits	100,000	150,000	250,000	250,000	250,000
6	Discounting factor@15%	0.87	0.76	0.66	0.57	0.50
7	NPV of Net benefit	86,957	113,422	164,379	142,938	124,294
	Discounting factor	0.15				
8	NPV of costs	2,527,959				
9	NPV of Revenue	3,159,948				
10	BCR	1.25				

Assumptions:

1. Seedling price is INR 2.5 per Unit
2. Entrepreneur farm will contribute his own land and partial labour
3. All other cost associated with venture will be invested directly by farmer which will give significantly higher return

14.3. Financial Indicators

Internal Rate of Return (IRR):

The project internal rate of return should be more than 15% as per the current financial scenario of the country. The project IRR is 72.5% therefore it is clearly indicating that the project is feasible for investment.

Payback Period:

The Payback period for the project is 1 year and 4 months. It should be less than 4 to 5 years therefore the project payback periods are within the limit.

Net Present Value (NPV):

With a discount rate of 15% and a span of 5 years, the projected cash inflows are worth Rs. 31,59,948. Today, this is greater than the present value of cost cash outflow of Rs. 25,27,959. The resulting positive NPV of the above project is Rs. 6,31,990 which indicates that pursuing the above project may be positive optimal.

ANNEXURE – QUESTIONNAIRE

December - 2018

DEVELOPMENT OF BUSINESS MODEL AND MODEL BANK SCHEME ON SSI IN MAHARASHTRA AND BIHAR UNDER UPNRM

Questionnaire for SSI Farmers

Informed Consent

Namaste, My name is and I work with ACCESS ASSIST (Brief About ACCESS). Explain the purpose of the survey.

I hope you will participate in the survey as your participation will help SSI Farming and building model financing scheme to improve knowledge and practices related to SSI. I assure you that the information collected will be used only for research purpose and your personal information will not be shared with others.

Do you want to ask anything about the survey? (Answer respondent's questions).

Respondent agreed to be interviewed.....1

Respondent did not agree to be interviewed2

Name and Signature of interviewer:

...../...../.....

Date:

A. Identification										
A01.	Name of State									
A02.	Name of District									
A03.	Name of Block									
A04.	Name of Gram Panchayat									
A05.	Name of Village/Hamlet									
A06.	Name of the interviewer									
A07.	Name of the respondent									
A08.	No of Family members of respondent									
A09.	Mobile number of the respondent									
B. Farming and SSI Adoption information										
B01.	What cultivation you have done in last three years?	Sugarcane Wheat..... Rice..... Other..... Not responded								
B02.	Do you know about SSI?	Yes No								
B03.	Explain different between SSI and normal Sugarcane cultivation.	Fully Explained Partially Explained Limited Knowledge Not knowing properly								
B04.	What is the crop cycle of Sugarcane?									
C. Land & Irrigation										
	How much land you have?									
	How much you use for SSI?									
	Is this land is your own or rented?									
	What is the rent per unit per year?									
	What is the source of irrigation for cultivation?									
	Annual cost of irrigation									
	Final Cost									
D. Sowing and Land Preparation										
	Labor cost till the harvesting									
	Fertilizer cost									
	Pesticide cost									
	Final Cost									

E. Regular maintenance and labour charges?		
	Labor cost till the harvesting	1. Activity one Cost 2. Activity two Cost
	Fertilizer cost	1. Fertilizer 1 Cost 2. Fertilizer 2 Cost 3. Fertilizer 3 Cost
	Pesticide cost	4. Pesticide 1 Cost 5. Pesticide 2 Cost 6. Pesticide 3 Cost
	Final Cost	
F. Harvesting		
	Where do you sell sugarcane?	
	How far that place from farm land?	
	What all cost associated with Harvesting?	1. Cost 2. Cost 3. Cost
	What is the production in last three years in tones?	1. Year 1 2. Year 2 3. Year 3
	Final Cost	
F. Price realisation		
	What is the average selling price of sugarcane in last three years?	1. Year 1 2. Year 2 3. Year 3
	How you get paid for sell of sugarcane?	1. Cash 2. Bank Transfer 3. Any other
	How long it will take to pay?	
	Final Price realization	
F. Financing Facility		
	Are you taking any credit facility from last three years?	
	If Yes, then from where?	
	How much you taken credit in last three years and at what interest rate?	
	When you repay the amount?	
G. Cost Calculation		
1	Total Cost of Production	
2	Price realization	
3	Gross Margin	
4	Cost of Capital	
5	Net Margin	



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Deutsche Gesellschaft für Internationale
Zusammenarbeit (GIZ) GmbH

A2/18 Safdarjung Enclave
New Delhi-110029 India

T: +91-11-494953535
E: nrm@giz.de
www.giz.de/India